

based on a hash of the election ID and user ID. Vault **902** returns a success/failure message to user blockchain API **602**. Finally, blockchain API **602** notifies voter **601** and registrar **903** that the registration has occurred.

[0107] FIG. 10 is a message flow diagram demonstrating how the United States Postal Service or other mailing entity can mail ballots. In some embodiments, the registrar **903** requests the all of the user IDs registered for a particular an election ID from blockchain **801**. The blockchain **801** responds with a hash of each token associated with the user and the address of the user. Registrar **903** then requests that the United States Postal Service **904** or other entity print the ballots based on the hashed tokens and addresses. In some embodiments, United States Postal Service **904** or other entity can then mail the ballots to the voter **601**. In some embodiments, the United States Postal Service **904** or other entity can notify the voter **601** when the ballot is placed in the mail and where the ballot is in the mail system as the ballot is mailed.

[0108] In some embodiments, the voter **601** can then receive the ballot from the postal service, fill out the ballot, and mail it back through USPS **904**. In some embodiments, USPS **904** can then use mail ballot processor **134** to read the barcodes or other computer or machine readable identifier attached to the physical ballots and determine if the mailed ballot was received in time for the votes to count in the election based on the time that the machine readable identifier was scanned by a mail processing system. In some embodiments, the mail ballot processor **134** can also be used to determine which entity should count a particular received ballot based on the machine readable identifier. For example, the mail ballot processor could determine that a particular county or state counting office was responsible for counting the ballot. The ballot can then be mailed on to the appropriate entity for counting.

[0109] FIG. 11 shows a message flow diagram for how a voter can receive a mailed ballot and then submits and mails the ballot. When the ballot is mailed, mail processing equipment can scan a computer readable code on the ballot. The mail processing equipment or connected network systems can identify the code as being associated with a ballot, and, in some embodiments, with a geographic area or with a particular voter. The mail system can update the status of the ballot with the system, can provide an expected delivery date for the ballot to the voter, track the ballot, etc. When the ballot is delivered to the voter, the carrier can scan the ballot when it is delivered, or the system can identify the out for delivery scan as a delivery. The postal service can gather the information from the ballots and the associated scans on mail processing equipment and/or by carriers, and provide reports to election officials regarding where, when, how many, and other statistics regarding the ballot delivery.

[0110] In some embodiments, the postal service can update a ballot record with a delivered status. When the voter returns the ballot via the mail, when the computer readable code is scanned on the mail processing equipment, the system can check to determine whether this code has been used before, as would be the case when the ballot was delivered, and can determine that the scanned ballot is a completed ballot, or that the ballot is being returned to the election official. Reports can be generated and provided to the election official with this information.

[0111] The ballot is First, the voter **601** scans the barcode or other computer or machine readable identifier on the

mailed ballot. In some embodiments, the barcode or other computer or machine readable identifier is formed based on a previously generated hash of the token (T1) and user ID (ID1) and is applied to the physical ballot. In some embodiments, the scan information is sent to blockchain API **602** which verifies this scanned barcode or other computer or machine readable identifier with vault **902** by comparing scanned codes with stored voterID, T1, E1, or other stored information. In some embodiments, these steps are accomplished by having voter **601** manually complete the paper ballot. Then voter **601** logs on to user interface **131** using user ID as previously discussed and chooses a “Scan Code” option on the user interface **131** to scan the barcode or other computer or machine readable identifier on the mailed ballot. The barcode or other computer or machine readable identifier is passed to the vault **902** which can compare it to hashes of previously stored tokens.

[0112] The voter **601** can then scan the individual votes on the ballot and submit them to blockchain API **602**. This can be done by voting in an application or a mobile computing device, by taking a picture of a filled out physical ballot and returning the image, etc. Blockchain API **602** can record the ballot on blockchain **801**. In some embodiments, voter **601** performs the scan through user interface **131**. User interface **131** can use a process choices feature to accumulate the scanned choices and, in some embodiments, confirm their accuracy by checking with ballot database **152**. The choices can be stored in a “voter ballot” internal database in user interface **131** until they are ready to be submitted. Once the voter **601** wants to submit the ballot, the user interface will use the “Submit Ballot” feature to fetch the relationship between the voter ID and the token. The ballot choices are saved in the voter-ballot off-chain database **154** along with voter ID, ballot barcode or other computer or machine readable identifier, hash of the digitally stored ballot, and timestamp. Then the voter ID, token, ballot hash, reference to the ballot in the voter-ballot database **154** and time stamp are recorded on the blockchain **801**. Finally, blockchain **801** can send a success message back to voter **601** through blockchain API **601** and the voter can mail the paper ballot to the United States Postal Service **904** or other entity. In some embodiments, the selections are not input until the mailed ballot is received.

[0113] FIG. 12 depicts a message flow diagram showing how a registrar can create an election template. First Registrar **603** enters the election details into user interface **131**. User interface **131** then records the election template blockchain API **602**. In some embodiments, the blockchain API **602** can reformat the election template into the JSON format. The blockchain API then stores the election record into ballot database **142** and records the election creation on blockchain **801**.

[0114] FIG. 13 depicts a message flow diagram showing an embodiment of how a registrar can create a ballot template. First Registrar **603** enters the ballot details into user interface **131**. User interface **131** then records the ballot template blockchain API **602**. In some embodiments, the blockchain API **602** can reformat the ballot template into the JSON format. The blockchain API then stores the ballot template into ballot database **142** and records the ballot template creation on blockchain **801**.

[0115] In some embodiments, some parts of the system can also be used to create a secure voting procedure using secure electronic identity labels for in person voting. In